



Davidson Seamount: Research and Protection



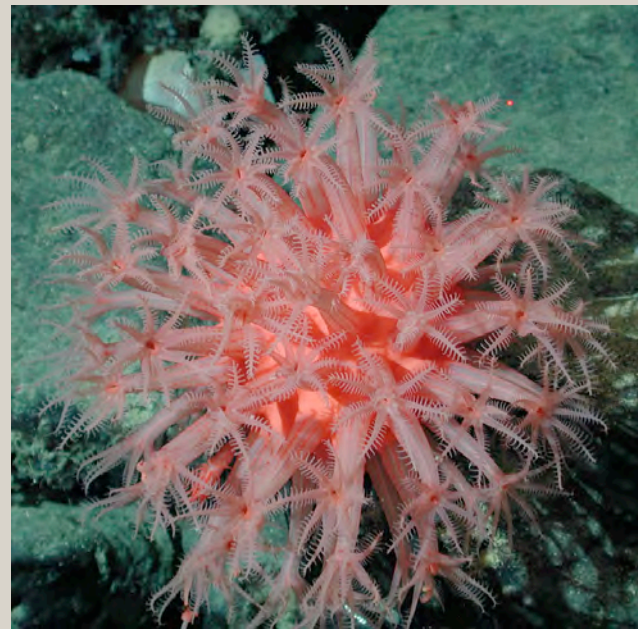
Erica J. Burton
Research Program
Monterey Bay National Marine Sanctuary



Presentation Outline



- Seamount Info
- Research at Davidson
- Management Plan
- Protection





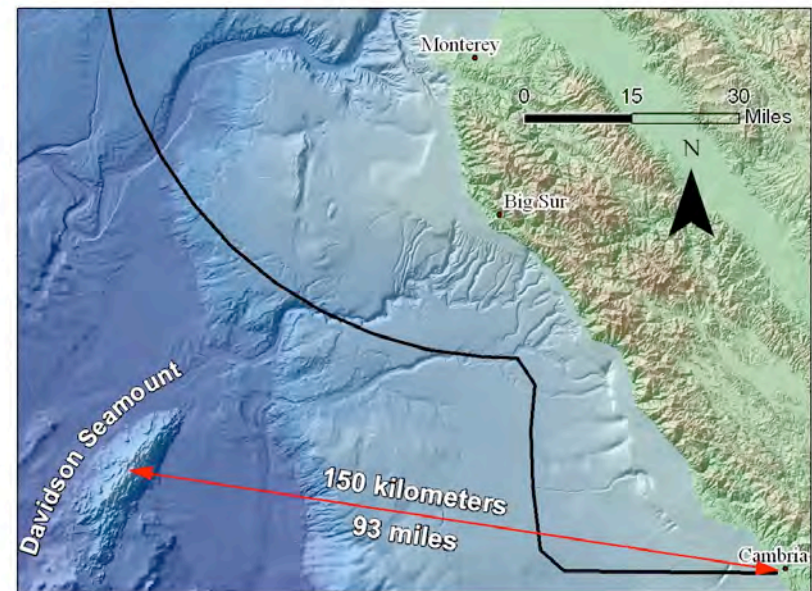
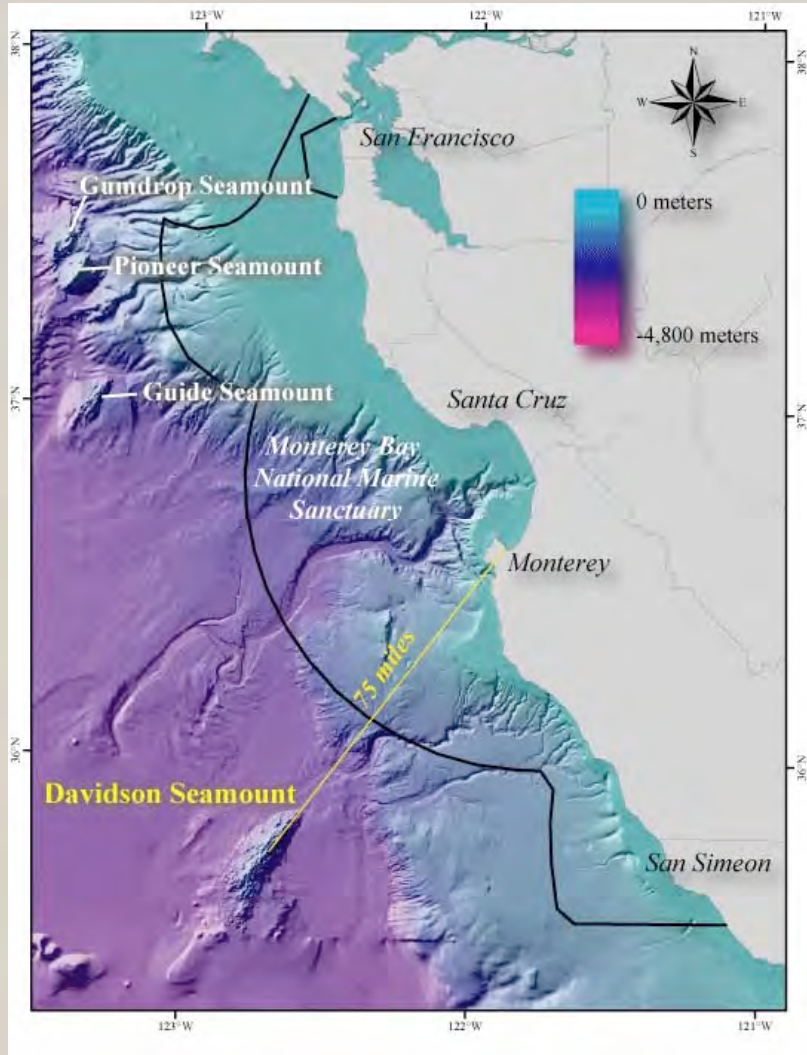
What are Seamounts?

- Undersea mountains, often volcanic origin
- Rise at least 1,000 meters from seafloor
- Peaks often in deep-sea (>200 m)
- Support high biodiversity
- Estimated >100,000 seamounts worldwide
- ~350 sampled, <100 in detail

Currently, no seamounts in the ONMS



Davidson Seamount

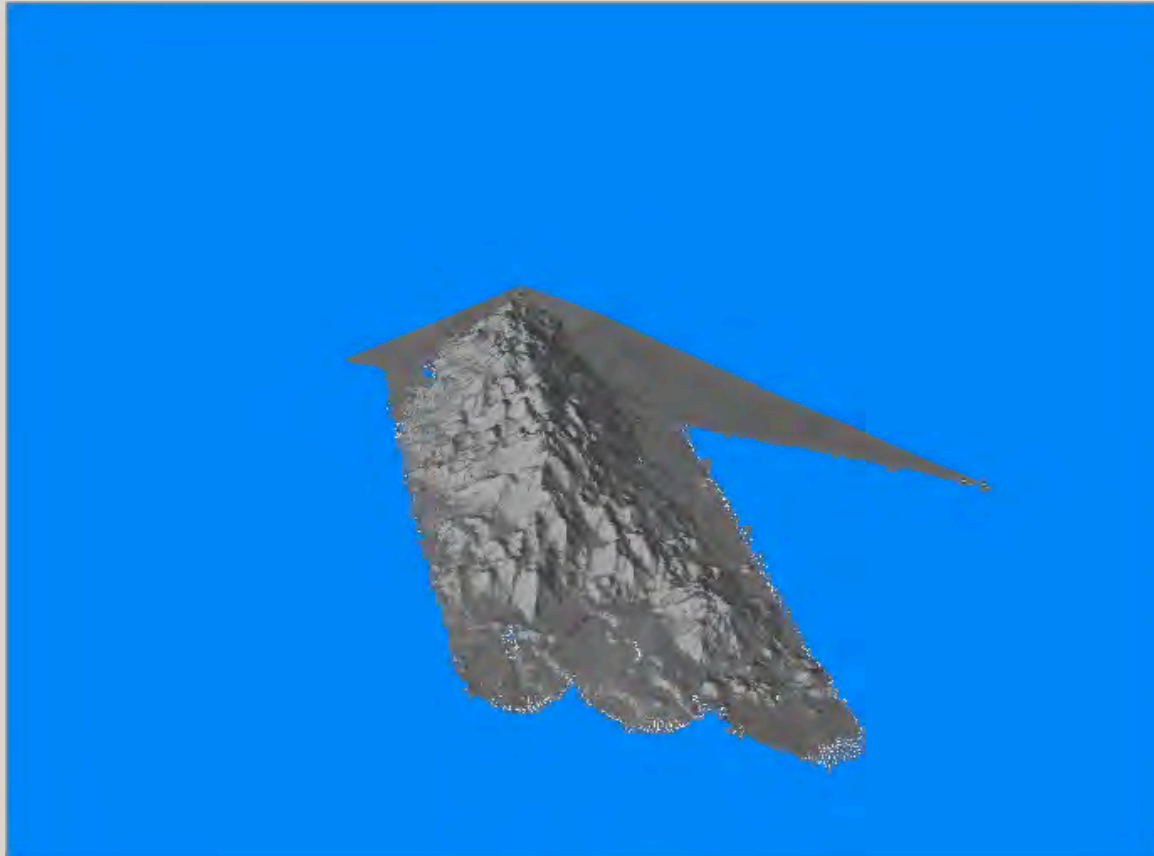


Location:

- 75 miles southwest of Monterey
- 93 miles west of Cambria



Davidson Seamount



- **Size:** 26 miles long; 8 miles wide
- **Depth at Summit:** 1,250 meters below sea surface
- **Depth at Base:** 3,530 meters (>2 miles)
- **Height:** 2,280 meters tall



Davidson Seamount



- One of the largest seamounts on West Coast
- First surveyed in 1933
- First geologic feature to be called a “seamount”
- Named for scientist George Davidson
- Last erupted ~9.8 million yrs ago
- In 2000, President Clinton directed NOAA to explore Davidson Seamount in partnership with other research institutions
- Today, Davidson Seamount is one of the best studied seamounts in the world



NOAA, B. A. Colonna Album



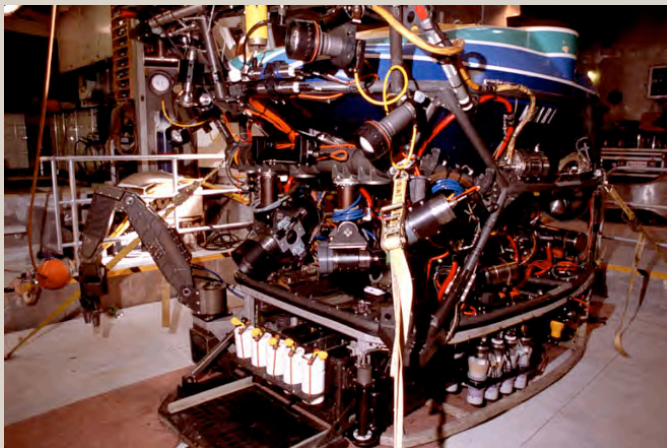
Technologies



R/V Western Flyer



R/V Zephyr



ROV Tiburon



AUV

MBARI assets



Recent Research

- **Biology:** Rare, new species; Taxonomic Guide
- **Geology:** Previously unrecognized type volcanism
- **Oceanography:** Seamount influences circulation patterns of California Current and Undercurrent
- **Faunal inventory database:** biogeography
- **Organisms:** Depth zonation patterns
- **Communities:** Source of larvae (e.g. deep-sea oases)
- **Coral age determination**



Taxonomic Guide



Marine Sanctuaries Conservation Series ONMS (succession number to be added by ONMS personnel)



Davidson Seamount Taxonomic Guide

DRAFT ver. 12
(8/05/08)

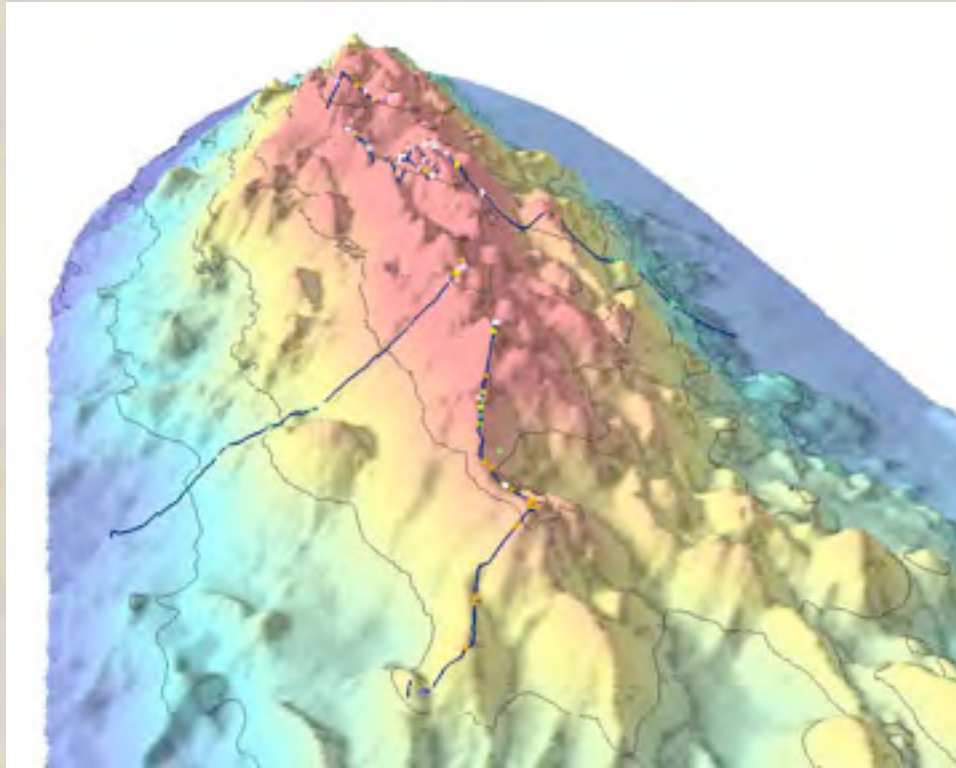
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Ocean and Coastal Resource Management
Office of National Marine Sanctuaries



- Image guide
- 237 organisms identified
- Rare species
- New species
- Depth ranges
- Available online soon



Depth zonation



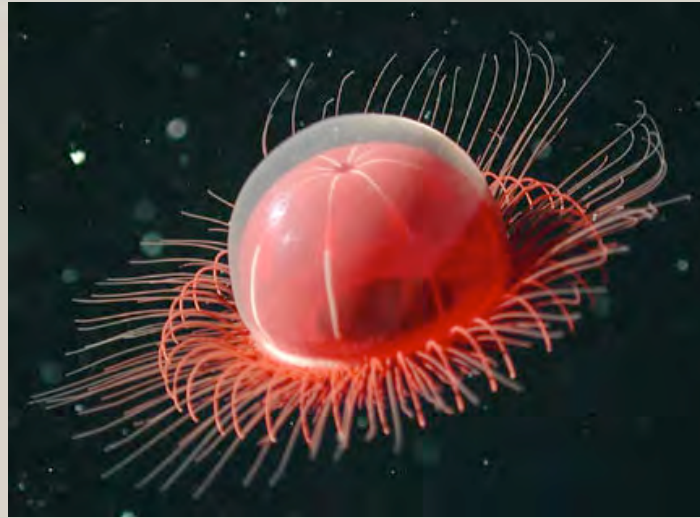
- Sea Surface
- Midwater
- Seamount
 - Crest
 - Slope
 - Base



Midwater Habitat



polychaete
(*Tomopteris* sp.)



jelly
(*Benthocodon* sp.)



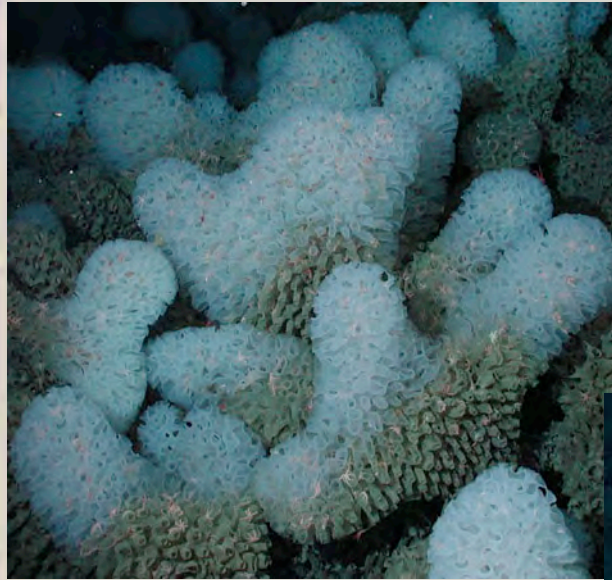
mystery mollusk
(Order Nudibranchia sp. nov.)



jelly
(*Tiburonia granrojo*)



Crest Habitat (1,250 - 1,500 m)



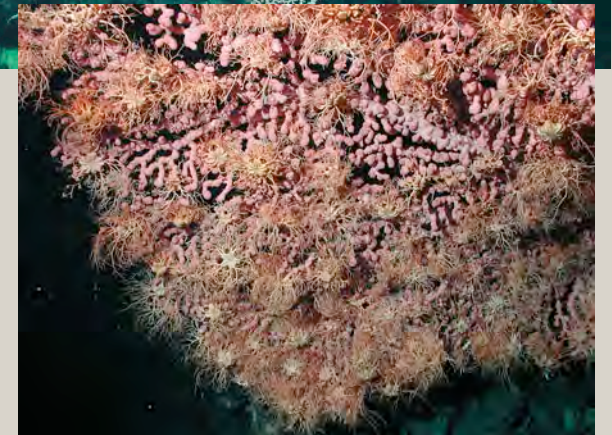
ruffle sponge
(*Farrea occa*)



Picasso sponge
(*Staurocalyptus* sp. nov.)



carnivorous sponge
(*Asbestopluma* sp. nov.)



bubble gum coral
(*Paragorgia* sp.)

basket stars
(*Gorgonocephalus* sp.)



Slope Habitat (1,500 - 2,500 m)



gorgonian coral
(*Acanthogorgia* sp.)
black coral
(*Lillipathes* sp.)



black coral
(*Trissopathes* sp.)



halosaur
(*Aldrovandia* sp.)



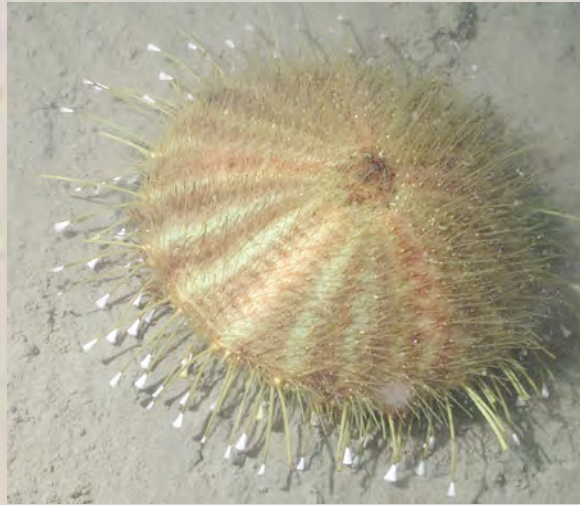
sea toad
(*Bathychaunax coloratus*)



witch eel
(*Venefica tentaculata*)



Base Habitat (2,500 - 3,250 m)



urchins
(*Tromikosoma* spp.)



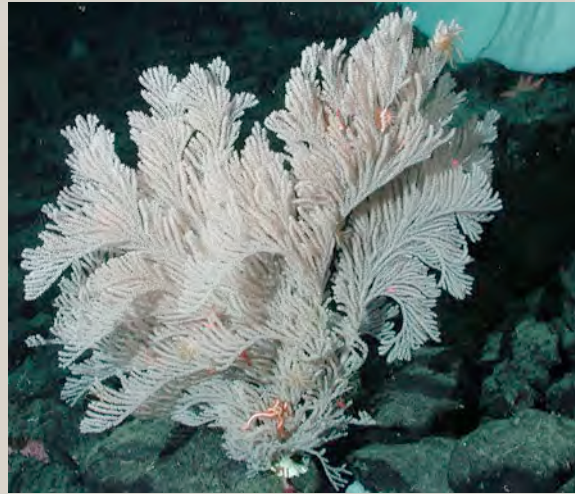
tube-dwelling anemones
sea cucumbers
sea stars



black coral
(*Trissopathes pseudotristicha*)
gorgonian coral
(*Narella* sp.)



Cold-water Corals at Davidson



0 1 2 4 km

☆ **Bubblegum Coral (*Paragorgia*)**

TPI value



Valley



Slope



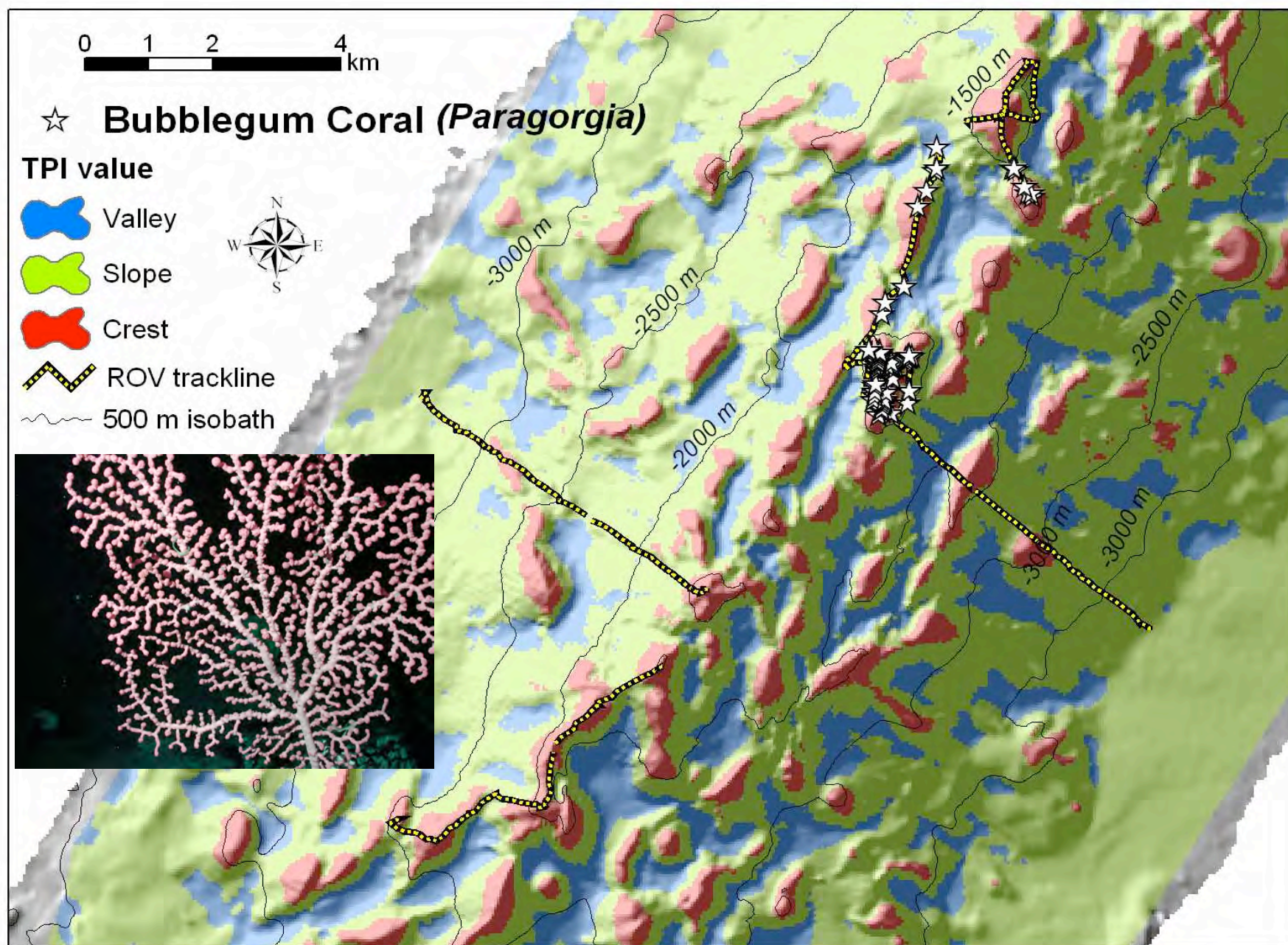
Crest



ROV trackline

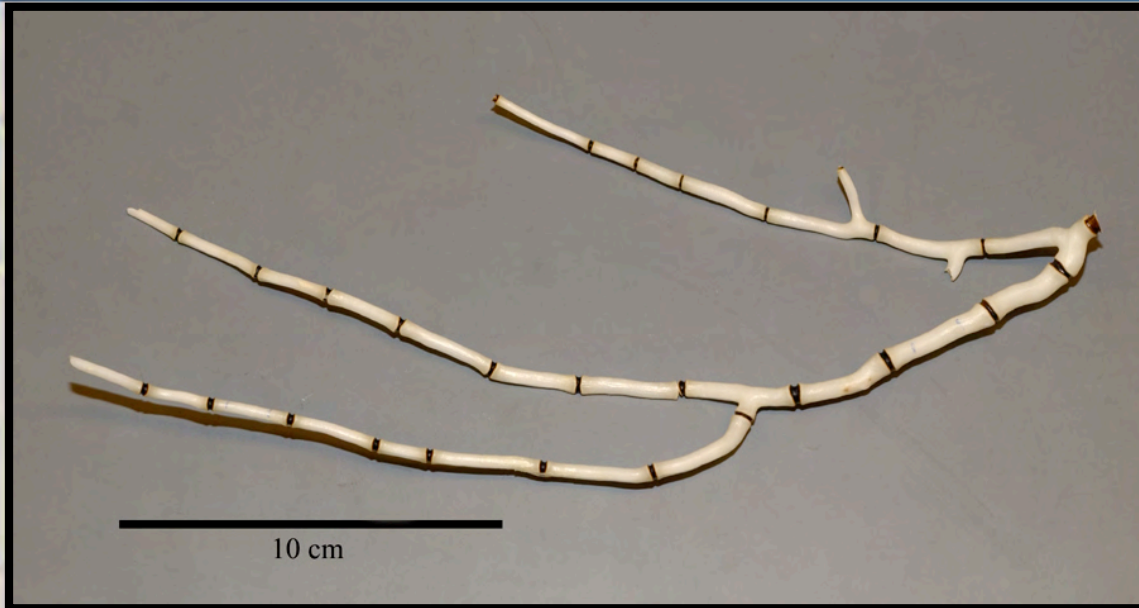


500 m isobath

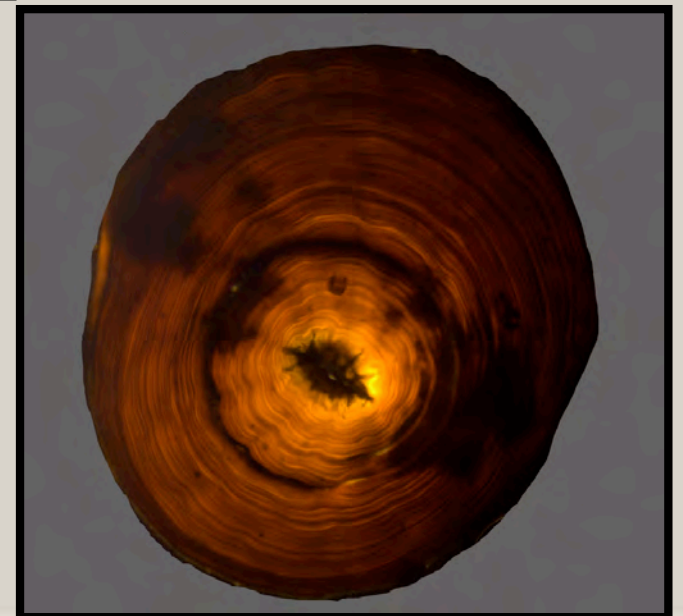




Coral age and growth



- Bamboo Coral (*Keratoisis* sp.)
- Radiometric dating indicates slow growing & long-lived (> 200 years)





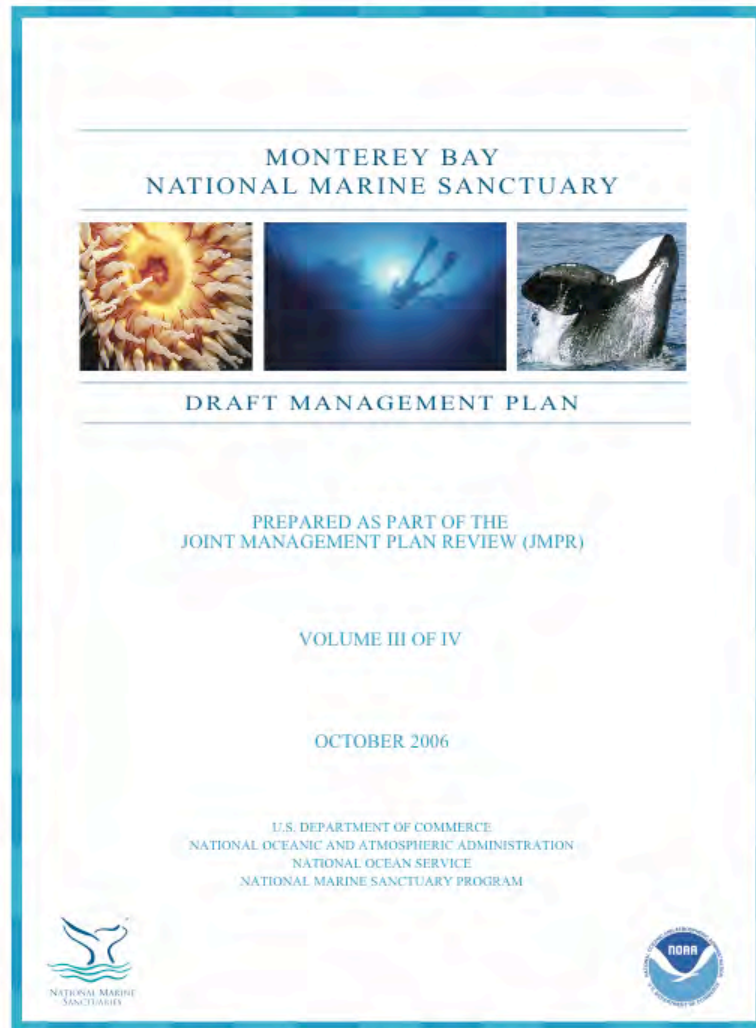
Education and Outreach



- Web sites
- Press events and related media
- Interactive CD
- “Natural Wonders” DVD
- Images and Video for San Simeon Coastal Discovery Center
- Images online: SIMoN Photo Database
- Office of Ocean Exploration poster
- BBC’s *Planet Earth* series
- Research publications
- Public presentations



Management Plan



❖ Coastal Development

1. Coastal armoring
2. Dredge disposal
3. Submerged cables

❖ Ecosystem Protection

1. Benthic habitats
2. **Davidson Seamount**
3. Emerging issues
4. Fishing Research and Education
5. Krill harvesting
6. Marine reserves

❖ Interpretive Facilities

❖ Introduced Species

❖ Multicultural Outreach

❖ Water Quality

1. Beach closures
2. Desalination
3. Protect riparian habitat
4. Revise MOA
5. WQPP Implementation

❖ Wildlife Disturbance

1. Tidepool protection
2. Marine mammal disturbance
3. Motorized Personal Watercraft



Management Plan



Davidson Seamount Qualities

- Conservation
- Ecological
- Education
- Scientific
- Historical
- Aesthetic





Management Plan



Davidson Seamount Action Plan

1. Conduct Site Characterization
2. Conduct Ecological Processes Investigations
3. Develop Resource Protection Program
4. Conduct Seamount Education and Outreach Initiatives



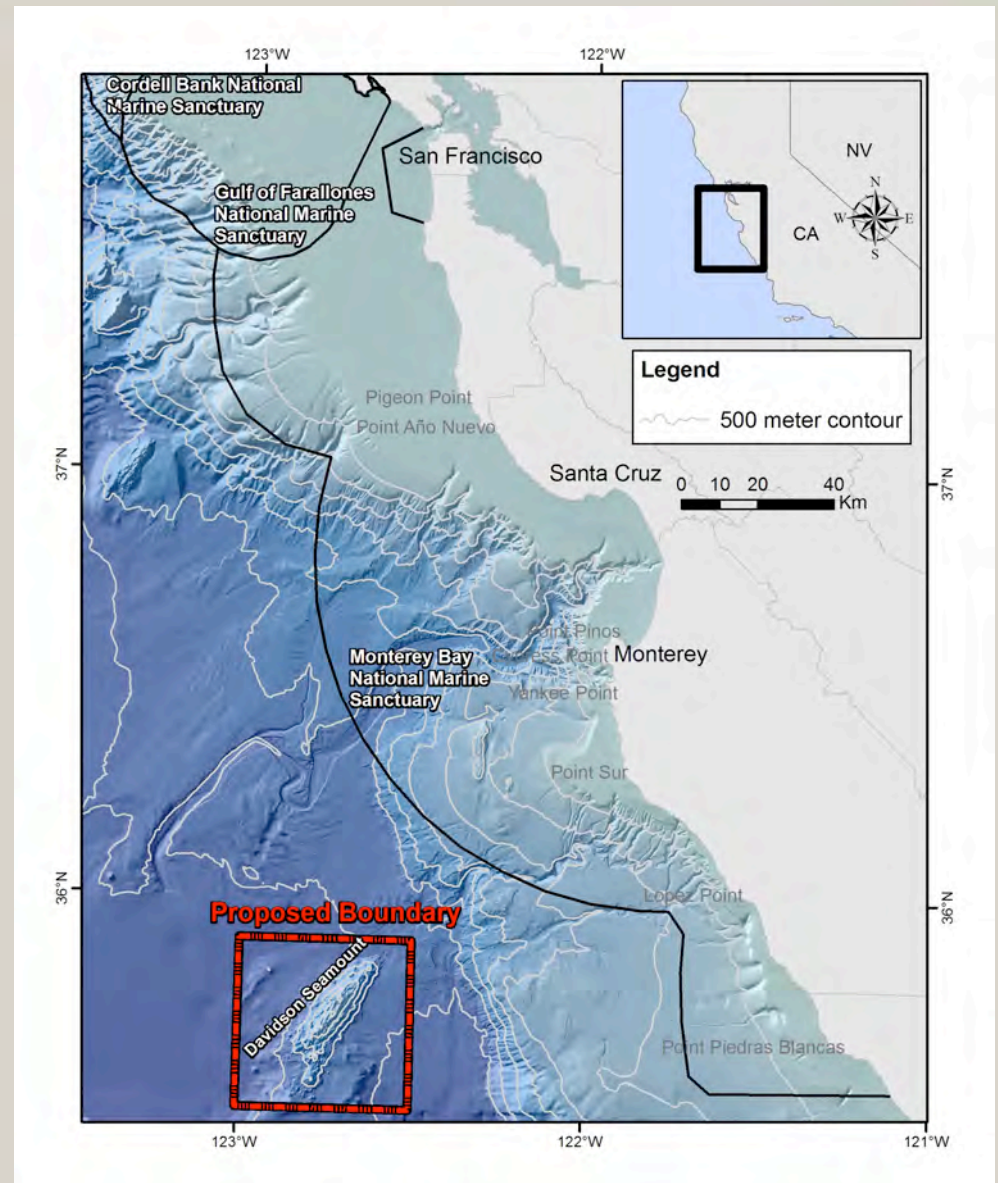


Protection



Proposed Action

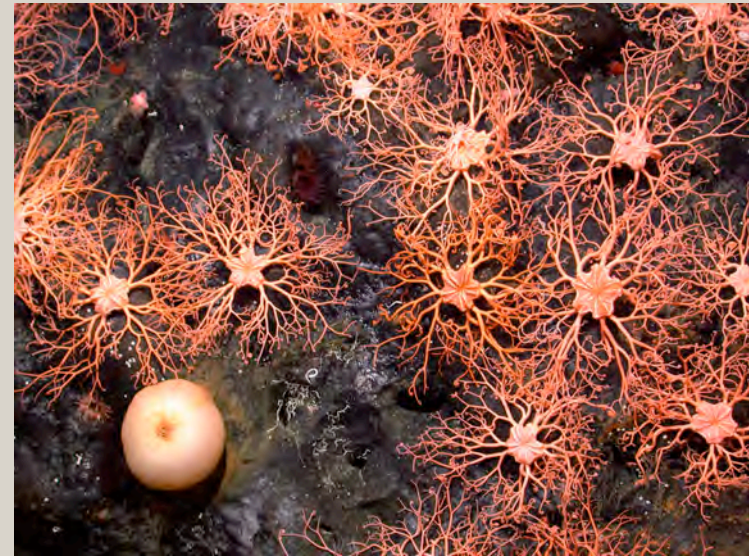
- Add seamount to MBNMS
- Apply standard MBNMS regulations
- Prohibitions (>3000 ft)
 - disturbance/take resource
 - possessing resource
- Allowed
 - existing fisheries above 3000 ft (e.g., albacore, swordfish)





Highlights

- Better informed public and science community on deep-sea corals and seamounts
- Davidson Seamount Action Plan
- NOAA Fisheries protection (regulation)
- Proposed Sanctuary protection (regulation)
- President Bush announced MBNMS expansion to include Davidson Seamount





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More Information

- [Regional California Seamounts and Banks](#)
- [Cordell Bank Seamounts and Banks](#)

Seamount.

Davidson Seamount is located 120 kilometers (75 miles) south of Monterey Bay. It is a volcanic seamount with deep-sea hydrothermal vents and deep-sea hydrothermal facilities that have the equipment and expertise to access and study the seamount. The volcano is approximately 2,300 meters (7,500 feet) tall and 42 kilometers (26 miles) wide (1,250 meters) below the ocean surface.

Seamounts, though common in the world's oceans, often have very different biological assemblages than the surrounding seafloor sediments, due likely to the complex, rocky and current-swept habitats. Rocky outcrops, particularly near seamount peaks, are inhabited by sponges that are found in more typical deep-sea environments.

Presently, no other seamounts in Monterey Bay have been studied. Several - including Davidson Seamount and Cordell Bank - are part of this sanctuary. This sanctuary was established by Bill Clinton in 1992 as part of an atmospheric partnership with the University of California and the University of Washington.

Photo Library



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